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REPUBLIC OF SOUTH AFRICA

DEPARTEMENT VAN  
HANDEL EN NYWERHEID



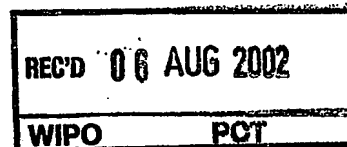
REPUBLIC VAN SUID-AFRIKA

DEPARTMENT OF TRADE  
AND INDUSTRY

31.07.02

PATENT OFFICE

Hiermee word gesertifiseer dat  
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the documents annexed hereto are true copies of:

Application forms P.1 and P.3, provisional specification and drawings  
of South African Patent Application No. 2001/5966 as originally filed  
in the Republic of South Africa on 19 July 2001 in the name of  
LAMB, PETER JAMES BRIAN for an invention entitled:  
"A TAMPON".

Geteken te  
Signed at

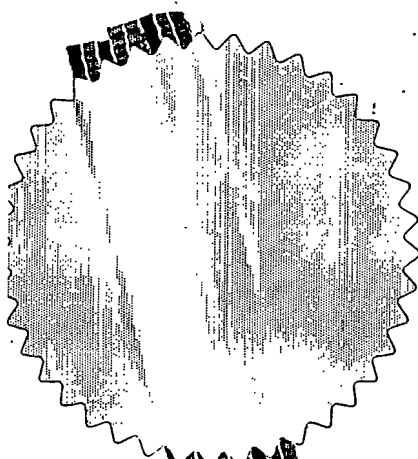
PRETORIA

in die Republiek van Suid-Afrika, hierdie  
in the Republic of South Africa, this

22nd

dag van  
day of

July 2002



**PRIORITY  
DOCUMENT**  
SUBMITTED OR TRANSMITTED IN  
COMPLIANCE WITH RULE 17.1(a) OR (b)

Registrateur van Patente  
Registrar of Patents

*11/07/02*

*Sertifikaat*

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31.07.02 *Certificate*

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REC'D 06 AUG 2002

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Application forms P.1 and P.3, provisional specification and drawings  
of South African Patent Application No. 2001/7563 as originally filed  
in the Republic of South Africa on 13 September 2001 in the name  
of LAMB, PETER JAMES BRIAN for an invention entitled: "A TAMPON".

Geteken te  
Signed at

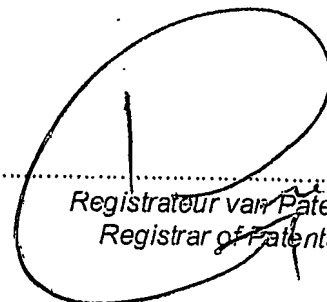
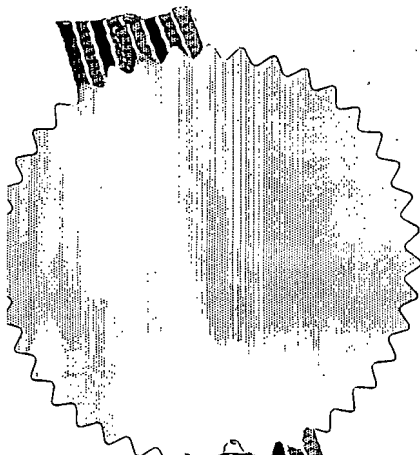
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in die Republiek van Suid-Afrika, hierdie  
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July 2002



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DOCUMENT**

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COMPLIANCE WITH RULE 17.1(a) OR (b)

PATENTS ACT, 1978  
DECLARATION AND POWER OF ATTORNEY  
(Section 30 - Regulation 8, 22(i)(c) and 33)

PATENT APPLICATION NO		
21	01	20015966

A&amp;A Ref: V14745

LODGING DATE	
22	19 JULY 2001

FULL NAME(S) OF APPLICANT(S)

71	LAMB, Peter James Brian
----	-------------------------

FULL NAME(S) OF INVENTOR(S)

72	LAMB, Peter James Brian
----	-------------------------

EARLIEST PRIORITY CLAIMED	COUNTRY	NUMBER	DATE
33	NIL	31	NIL
			32
			NIL

NOTE: The country must be indicated by its International Abbreviation - see schedule 4 of the Regulations

TITLE OF INVENTION

54	A TAMPON
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\* I/We LAMB, Peter James Brian

hereby declare that :-

1. I/we am/are the applicant(s) mentioned above;
- \*\* ~~2. I/we have been authorized by the applicant(s) to make this declaration and have knowledge of the facts herein stated in the capacity of \_\_\_\_\_ of the applicant(s);~~
- \*\*\* 3. the inventor(s) of the abovementioned invention is/are the person(s) named above and the applicant(s) has/have ~~acquired the right to apply by virtue of an assignment from the inventor(s);~~
4. to the best of my/our knowledge and belief, if a patent is granted on the application, there will be no lawful ground for the revocation of the patent;
- \*\*\*\* ~~5. this is a convention application and the earliest application from which priority is claimed as set out above is the first application in a convention country in respect of the invention claimed in any of the claims; and~~
6. the partners and qualified staff of the firm of ADAMS & ADAMS, patent attorneys, are authorised, jointly and severally, with powers of substitution and revocation, to represent the applicant(s) in this application and to be the address for service of the applicant(s) while the application is pending and after a patent has been granted on the application.

SIGNED THIS 12TH DAY OF MARCH

Company Name: \_\_\_\_\_

Full Names: LAMB, Peter James Brian

Capacity: \_\_\_\_\_

REGISTRAR OF PATENTS, DESIGNS, TRADE MARKS AND COPYRIGHT
2001 -07- 19
REGISTRATEUR VAN PATENTE, MODELLE, HANDELSMERKE EN OUTEURSREG

(no legalization necessary)

- \* In the case of application in the name of a company, partnership or firm, give full names of signatory/signatories, delete paragraph 1, and enter capacity of each signatory in paragraph 2.
- \*\* If the applicant is a natural person, delete paragraph 2.
- \*\*\* If the right to apply is not by virtue of an assignment from the inventor(s), delete "an assignment from the inventor(s)" and give details of acquisition of right.

APPLICATION FOR A PATENT AND  
ACKNOWLEDGEMENT OF RECEIPT  
(Section 30(1) Regulation 22)

19.7.01

R 060.00

THE GRANT OF A PATENT IS HEREBY REQUESTED BY THE UNDERMENTIONED APPLICANT  
ON THE BASIS OF THE PRESENT APPLICATION FILED IN DUPLICATE

REPUBLIEK VAN SUID AFRIKA

21 01 PATENT APPLICATION NO 20015966

71 FULL NAME(S) OF APPLICANT(S)

LAMB, Peter James Brian

ADDRESS(ES) OF APPLICANT(S)

12 Clifford Road, Irene, Pretoria, 1675, Republic of South Africa

54 TITLE OF INVENTION

A TAMPON

Only the items marked with an "X" in the blocks below are applicable.

☐ THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P.2. The earliest priority claimed is

Country:

No:

Date:

☐ THE APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO

21 01

☐ THIS APPLICATION IS A FRESH APPLICATION IN TERMS OF SECTION 37 AND BASED ON  
APPLICATION NO

21 01

THIS APPLICATION IS ACCOMPANIED BY:

- ☒ A single copy of a provisional specification of 12 pages
- ☒ Drawings of 2 sheets
- ☐ Publication particulars and abstract (Form P.8 in duplicate) (for complete only)
- ☐ A copy of Figure of the drawings (if any) for the abstract (for complete only)
- ☐ An assignment of invention
- ☐ Certified priority document(s). (State quantity)
- ☐ Translation of the priority document(s)
- ☐ An assignment of priority rights
- ☐ A copy of Form P.2 and the specification of RSA Patent Application No
- ☒ Form P.2 in duplicate
- ☒ A declaration and power of attorney on Form P.3
- ☐ Request for ante-dating on Form P.4
- ☐ Request for classification on Form P.9
- ☐ Request for delay of acceptance on Form P.4
- ☐ Extra copy of informal drawings (for complete only)

21 01

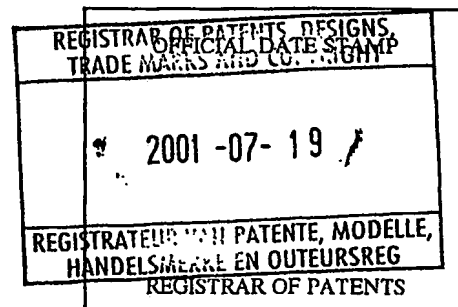
74 ADDRESS FOR SERVICE: Adams & Adams, Pretoria

Dated this 19TH day of JULY 2001

ADAMS & ADAMS  
APPLICANTS PATENT ATTORNEYS

The duplicate will be returned to the applicant's address for service as  
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A&A P201



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PATENT ATTORNEYS  
PRETORIA

FORM P6

REPUBLIC OF SOUTH AFRICA  
Patents Act, 1978

## PROVISIONAL SPECIFICATION

(Section 30 (1) - Regulation 27)

21	01	OFFICIAL APPLICATION NO
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**20015966**

22	LODGING DATE
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**19 JULY 2001**

71	FULL NAME(S) OF APPLICANT(S)
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**LAMB, Peter James Brian**

72	FULL NAME(S) OF INVENTOR(S)
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**LAMB, Peter James Brian**

54	TITLE OF INVENTION
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**A TAMPON**

THIS INVENTION relates to a tampon.

Catamenial tampons are widely used and there is a long felt need to improve their efficiency in preventing leakage of menses or menstrual fluid and the level of comfort with which they can be worn, and also to reduce the occurrence of negative side-effects caused by their use.

According to the invention, there is provided a tampon which includes an elongate absorbent body and at least one surface formation, of a material different to the absorbent body, applied over an exterior surface of the absorbent body, the surface formation being configured to inhibit expansion of at least a portion of the absorbent body in use due to absorption of menses by the absorbent body, and/or to facilitate insertion and seating of the tampon in a vagina.

When configured to inhibit expansion, the or each surface formation thus ensures that the portion of the absorbent body affected thereby retains its shape and dimensions to at least some extent, whilst other portions of the body not affected thereby expand relatively freely during absorption of menses.

The absorbent body may have a shape and dimensions as described in the specification of South African Patent Application No. 2000/2944, which is incorporated in its entirety herein by way of reference. In particular, the absorbent body may thus include one or more of the following features as described in South African Patent Application No. 2000/2944: bilaterally extending wings, ending in two side edges, non-planar upper and lower surfaces, and a rounded leading end with a

concavely curved transitional region between a rear portion of the body and a front portion of the body.

At least one surface formation, or a portion of at least one surface formation may be in the form of a coating on a portion of the exterior surface of the absorbent body. Each surface formation may be of a synthetic plastics or polymeric material, and may be non-absorbent and/or elastic.

The coating may consist of any thermoplastic, elastomeric or resin type material with no or significantly reduced water absorbent properties compared to cellulose. These polymeric materials can be applied onto the surface of the tampon by conventional techniques, e.g. dipping, spray coating, low pressure injection moulding, jet coating printing and one or two reactive component injection moulding.

The choice of the adequate application technique depends on the nature of the polymeric material. Emulsions and/or dispersions are preferentially applied by dipping, spraying or jet coating processes. Low pressure injection moulding processes can be considered for reactive or non reactive bulk materials having sufficiently low viscosities at temperatures which do not damage the cellulose or other base material of the tampon. For reactive one or two component systems known mixing and injection devices can be used.

It has already been mentioned that the polymeric materials of this invention possess no or a significantly reduced water absorbence. This property can be described by the equilibrium contact angle of water on corresponding smooth polymer surfaces. Contact angles between  $20^{\circ}$  and  $120^{\circ}$ , preferentially  $30^{\circ}$  and  $120^{\circ}$ , specifically  $40^{\circ}$  and  $110^{\circ}$ , more specifically  $60^{\circ}$  and  $110^{\circ}$  are beneficial. This contact angle difference of at least  $20^{\circ}$  compared to the cellulosic base material (complete wetting) guarantees that blood and other body liquids are directed to specifically designed portions of the tampon away from the surface formations.

Preferred thermoplastic materials comprise homo- and copolymers based on acrylic/methacrylic acid, polyesters, polyamides, polyhaloolefines and polyolefines. Preferred elastomeric materials comprise homo- and copolymers based on butadiene, isoprene and isobutene. Depending on the composition reactive systems can belong to the thermoplastic, elastomeric or resin type of material. Polyurea- and/or polyurethane structures comprising homo- and/or copolymers are preferred. It is within the scope of the invention to modify the thermoplastic, elastomeric and reactive system based polymers by addition of adequate cross-linking agents.

At least one surface formation, or a portion of at least one surface formation, may be in the form of a thin band or strip or the like applied to the exterior surface of the absorbent body. In one embodiment of the invention, a plurality of bands or strips are provided on the exterior surface of the absorbent body. At least some of the bands or strips may be in the form of broken lines, i.e. they may be discontinuous.

Each surface formation may stand proud of the exterior surface of the absorbent body. Thus, the surface formation or formations may form or define a raised pattern on the exterior surface of the absorbent body. The raised pattern can advantageously assist in inhibiting slipping of the tampon in use towards the vaginal opening, by interacting with the rugae of the vagina.

The leading end or nose of the absorbent body may be coated. This renders the tampon easier and less painful to insert and allows the leading end easily to slip into the posterior vaginal fornix and allows the tampon to be located higher up in the vagina, thereby making use of extra space provided by the posterior vaginal fornix. In use, the cervix can thus trap the tampon of the invention, which is higher up in the vagina than is the case of conventional tampons, thereby reducing the risk that the tampon will slip down the vagina and wedge between the *levator ani*, which can be very painful to a user of a tampon.



An exterior surface portion of the tampon which in use will be in contact with the cervix of a user may be coated. The delicate lining of the cervical canal of some women is exposed at the opening of the cervix, particularly in women who gave natural birth to children (cervical ectropion or erosion). Conventional tampons may cause microscopic trauma to the delicate lining of a cervical erosion or ectropion which may aggravate cervical infection, discharge and bleeding. The coated tampon of the invention may reduce cervicitis and bleeding. Decreasing mucosal microtrauma has advantages in combatting HIV/aids transmission, as will be appreciated. Furthermore, as the portions of the absorbent body affected by surface formations configured to inhibit expansion, and in particular the leading end, do not in use expand or swell to the same extent as a conventional tampon, the risk of plugging of the cervix and the resultant haematometra and retrograde menstruation with concomitant symptomatology is reduced.

A rear or trailing end portion of the absorbent body may include a surface formation configured to inhibit expansion, e.g. a coating. When in the form of a coating, the coating may define an end cap for the rear end of the absorbent body. Advantageously, such an end cap inhibits discharge of menses from the rear end of the absorbent body caused by squeezing of the absorbent body during movement of the body of a user. Furthermore, the rear end of the absorbent body of the invention typically has a width which is greater than its thickness and which is greater than the diameter of a conventional cylindrical tampon. The end cap ensures that the rear end of the absorbent body in use retains its shape and dimensions at least to some extent and inhibits the formation of a tapered or pointed rear end due to swelling. This reduces the risk that the absorbent body will wedge between the *levator ani*.

Some of the bands or strips may be longitudinally extending over the exterior surface of the absorbent body and may be spaced from each other. The longitudinally extending bands or strips may be parallel to each other. Although discontinuous longitudinally extending spaced bands or strips will still allow expansion

of the absorbent body, insertion and wear of the tampon will be easier and more comfortable and less microtrauma will be caused to the vaginal mucosa of a user.

Some of the bands or strips may be transversely arranged over the exterior surface of the absorbent body and may be longitudinally spaced from each other. When the absorbent body includes bilaterally projecting wings, these strips or bands may extend over the wings and portions thereof may be under tension and portions thereof may be compressed when the side edges of the body are folded underneath the body, thereby assisting in use in actively deploying the wings.

The invention extends to a tampon which includes an elongate absorbent body, a portion of an external surface of the absorbent body being covered by a coating.

The coating may be as hereinbefore described.

The invention will now be described, by way of example, with reference to the accompanying diagrammatic drawings, in which

Figure 1 shows a three dimensional view of one embodiment of a tampon in accordance with the invention;

Figure 2 shows a top plan view of the tampon of Figure 1;

Figure 3 shows a side view of the tampon of Figure 1;

Figure 4 shows a top plan view of another embodiment of a tampon in accordance with the invention;

Figure 5 shows a top plan view of a further embodiment of a tampon in accordance with the invention; and

Figure 6 shows a top plan view of yet another embodiment of a tampon in accordance with the invention.

Referring to Figures 1 to 3 of the drawings, reference numeral 10 generally indicates a catamenial tampon in accordance with the invention. The tampon

10 comprises an elongate body 12 of an absorbent material having a leading end 14 and a trailing end 16.

The body 12 is non-circular in outline in end view and in cross-section, with extremities of the body 12 falling on the outline of an oval or ellipse in end view. The body 12 thus has a width which is greater than a thickness thereof, as well as a length that is greater than it's width. Typically, the body 12 has a length of about 5 cm, a width of about 2 cm, and a maximum thickness of about 0,75 cm.

The body 12 defines an upper or superior surface 18, a lower or posterior surface 20, and two opposed side edges 22 which extend longitudinally. The upper surface 18 and the lower surface 20 converge towards each other to define the side edges 22 and also to define two longitudinally extending bi-laterally projecting wings 24. The side edges 22 are somewhat rounded.

Both the upper surface 18 and the lower surface 20, in central longitudinally extending portions thereof, are non-planar, being concave when the body 12 is viewed in cross-section or end view. The central longitudinally extending concave portion of the upper surface 18 is indicated by reference numeral 26.

The body 12 comprises absorbent elongate fibres arranged or orientated at right angles relative to a central longitudinal axis (not shown) of the body 12. In other words, each fibre is arranged side-ways or radially, having one end closer to the central longitudinal axis of the body 12 and the other end further from the central longitudinal axis of the body 12.

The upper surface 18 of the body 12 converges gradually towards the lower surface 20 over a major portion of the length of the body 12, and then converges or drops down more sharply and in a slightly concave fashion (in side view) towards the lower surface 20 to end in the leading end 14, which is wedge-shaped

and has a rounded leading edge. This configuration is clearly shown in Figure 3 of the drawings.

Corners of the body 12 are rounded, as is clearly shown in Figure 2 of the drawings. A string 32 is attached to the body 12, to the trailing end 16 thereof.

5           The tampon 12 includes surface formations of a thermoplastic, elastomeric or resin material which cover portions of the upper surface 18 and the lower surface 20 of the body 12. A leading end portion or nose of the body 12 and an area immediately behind the leading end portion, and extending rearwardly onto the central longitudinally extending concave portion 26, is coated with a coating 34 of said material.

10           A rear end portion of the body 12 is coated by a coating 36 of said material. The coating 36 covers the rear end 16 of the body 12 and also extends curcumferentially around the rear end portion of the body 12.

15           Discontinuous elongate strips or bands 38 of said material extend longitudinally over the upper surface 18 and lower surface 20 of the body 12 between the coatings 34, 36. The bands or strips 38 are spaced from each other and are substantially parallel.

20           A plurality of transversely arranged bands or strips 40 of said material intersect at least some of the longitudinally extending bands or strips 38. The transversely arranged bands or strips 40 are longitudinally spaced from each other and extend completely around the body 12. The bands 40 are continuous in those areas of the body 12 of the tampon 10 which are intended to be constricted, and discontinuous in areas where constriction is not desired, to allow for expansion of the body 12 of the tampon 10.

The tampon 10 is used in similar fashion to a conventional tampon. However, unlike a conventional circular cylindrical tampon, the concave central longitudinally extending portions of the upper and lower surfaces 18, 20, conform in use with the anterior wall of the vagina, which is convex as a result of pressure from the bladder, and with the posterior wall of the vagina, which is convex as a result of the presence of the rectum, respectively. This enhances comfort and reduces leakage of fluid and may aid in preventing slippage of the tampon 10. The two wings 24 fill the lateral extremities of the vagina, thus further inhibiting leakage of menstrual fluid past the tampon 10.

The coating 34 over the nose of the body 12 renders the tampon easier and less painful to insert and it allows the leading end easily to slip into the posterior vaginal fornix. As a result, the tampon can be located higher up in the vagina, thereby making use of the extra space provided by the posterior vaginal fornix. Pressure from the cervix of the anteverted uterus may serve to pinch the tampon nose between the cervix and posterior vaginal wall thereby further inhibiting distal slippage of the tampon.

A portion of the coating 34 is in use in contact with the cervix of the user. As is well known to medical practitioners, the delicate lining of the cervical canal (endocervical thelium) of some women is exposed at the opening of the cervix (external cervical os). The portion of the coating 34 in contact with the cervix, and in particular the cervix opening, may reduce microtrauma to ectropion or erosion caused by friction between the delicate epithelium skin and the absorbent and abrasive fibres of an uncoated tampon. Microtrauma to the epithelium of erosion or ectropion may interrupt the integrity of the epithelium by microorganisms resulting in cervicitis, vaginal discharge and abnormal vaginal bleeding. Protection of the epithelium and the reduction of genital tract microtrauma are very desirable to combat the transmission of HIV.

In use, the coating 34 inhibits expansion or swelling of the nose or front end portion of the absorbent body 12, due to absorption of menses by the body 12. The nose portion of the body 12 thus in use retains its shape and dimensions substantially. As a result, the risk of plugging of the cervix and resultant retrograde menstruation is reduced by the presence of the coating 34 on the nose portion of the body 12 and the first few circumferential bands or strips 40 around the body 12 in the region behind the coating 34.

The coating 36 defines an end cap for the rear end portion of the absorbent body 12. The inventor expects the coating 36 to inhibit discharge of menses from the rear end portion of the absorbent body 12 caused by squeezing of the absorbent body 12 during movement of the body of the user. Furthermore, the coating 36 inhibits expansion or swelling of the rear end portion of the body 12, thereby ensuring that the rear end portion in use more or less retains its shape and dimension. The formation of a tapered or pointed rear end due to swelling is thus inhibited, which reduces the risk that the absorbent body 12 will wedge between the *levator ani* of the user. This may be of particular importance to those women who regularly suffer discomfort and pain due to the wedging of a conventional tampon between the *levator ani*.

The discontinuous longitudinally extending bands or strips 38 facilitate insertion of the tampon 10 into a vagina, while allowing longitudinal expansion of the body 12. The bands or strips 38 are raised above the surface of the absorbent body 12 and are easily lubricated by body fluids. Insertion of the tampon 10 into a vagina is thus easier and less microtrauma is caused to the vaginal mucosa of a user during insertion and the tampon will be more comfortable to wear by allowing body movement without microfriction.

The transversely arranged bands or strips 40 define a raised pattern on the exterior surface of the absorbent body 12. The transversely arranged bands or strips 40 in use interact with the rugae of the vagina, thereby assisting in inhibiting

slipping of the tampon 10 in use towards the vaginal opening. They also function to inhibit expansion of the tampon in areas where constriction is desired.

In order to insert the tampon 10 into a vagina, the wings 24 may be folded such that the side edges 22 are located below the rest of the body 12. The tampon 10 is then inserted by means of an applicator or with a finger. Deployment of the wings 24 in the vagina may then be actively assisted by the transversely arranged bands or strips 40. As will be appreciated, when the side edges 22 are located below the rest of the body 12, the portions of the bands or strips 40 on the upper surface 18 of the body 12 will be stretched, whereas the portions of the bands or strips 40 on the lower surface 20 of the body 12 will be compressed. This stretching and compression of the bands or strips 40 assist in actively deploying the wings 24 in use.

Referring to Figures 4, 5 and 6 of the drawings, reference numerals 50, 60 and 70 respectively indicate further embodiments of a tampon in accordance with the invention. The tampons 50, 60, 70 are similar to the tampon 10 and the same reference numerals are thus used to indicate the same or similar parts or features. As can be clearly seen in Figures 4, 5 and 6, the tampons 50, 60 and 70 differ from each other and from the tampon 10 in the number and arrangement of the bands or strips 38, 40, if present, and in the presence of other raised surface formations.

In Figure 4, the tampon 50 includes, in addition to the coatings 34, 36, and three continuous bands or strips 40, a plurality of transversely extending rows of short spaced raised strips 52. With reference to Figure 5 of the drawings, the tampon 60 includes, in addition to the coatings 34, 36, a single discontinuous longitudinally extending strip 38 and a plurality of transversely arranged strips 40, also a plurality of transversely arranged rows of raised dots 62, only two rows of which are shown. With reference to Figure 6 of the drawings, the tampon 70 includes the coatings 34, 36, a single longitudinally extending strip 38 and a plurality of V-shaped surface

formations 72. Surface formations in the form of raised dots 74 arranged in a V are also provided.

5 The tampons 50, 60, 70 are used in the same fashion as the tampon 10, with the formations 52, 62, 72, 74 assisting in retaining the tampon in the desired location in the vagina.

The Applicant believes that the tampons of the invention, as illustrated, can be worn with increased comfort and safety compared to conventional tampons without surface formations configured to inhibit expansion and/or to facilitate insertion and seating of the tampon.

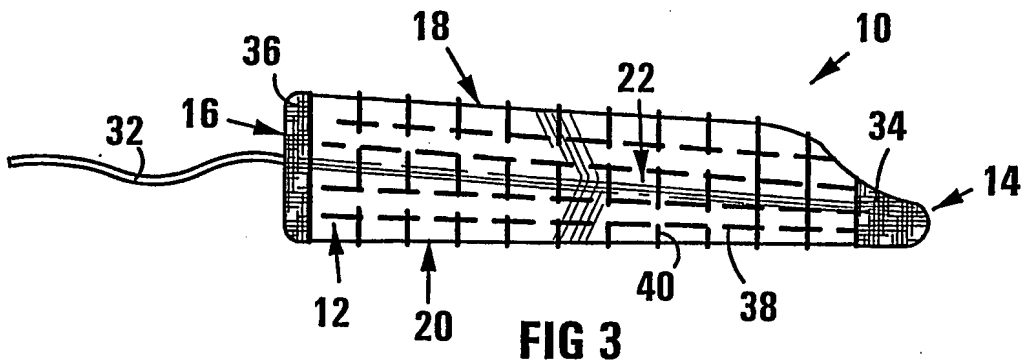
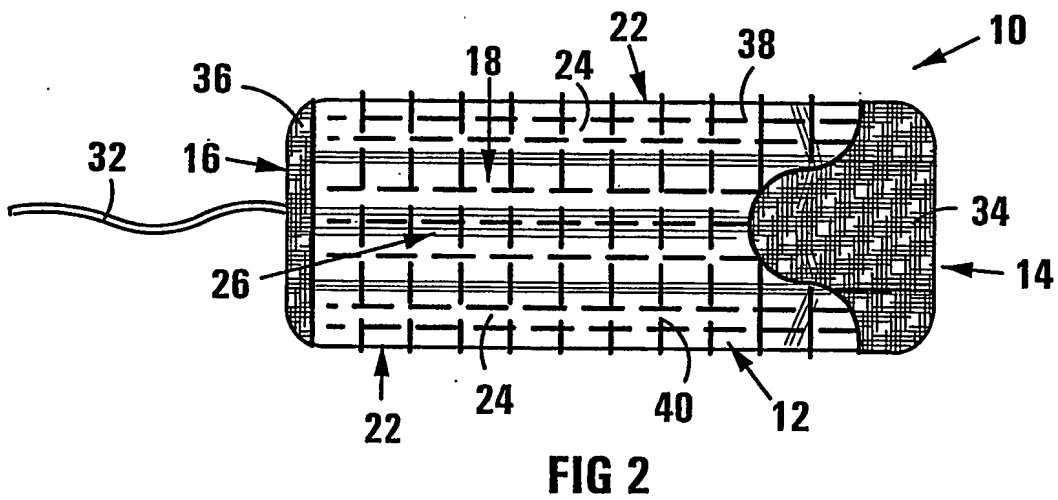
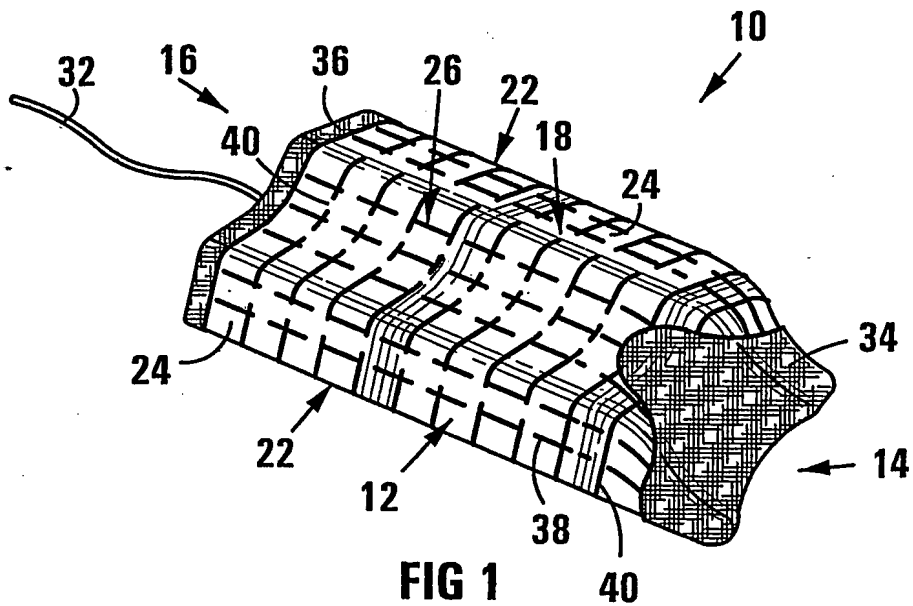
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DATED THIS 19<sup>TH</sup> DAY OF JULY 2001



ADAMS & ADAMS  
APPLICANT'S PATENT ATTORNEYS





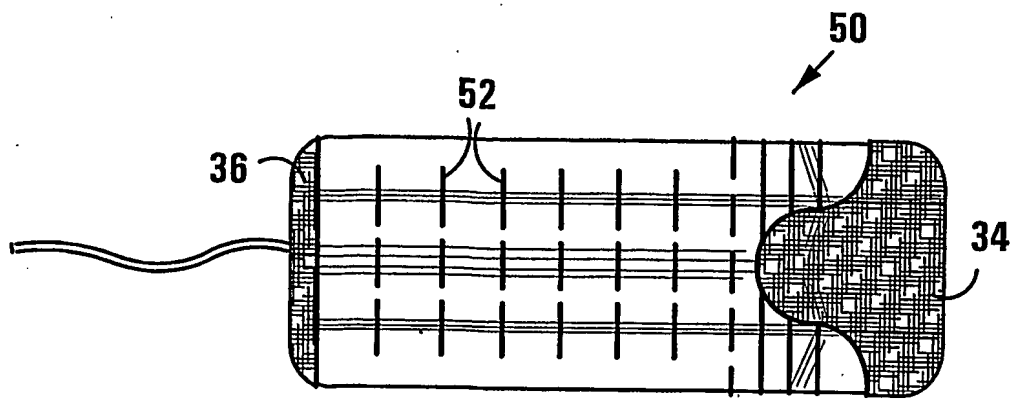


FIG 4

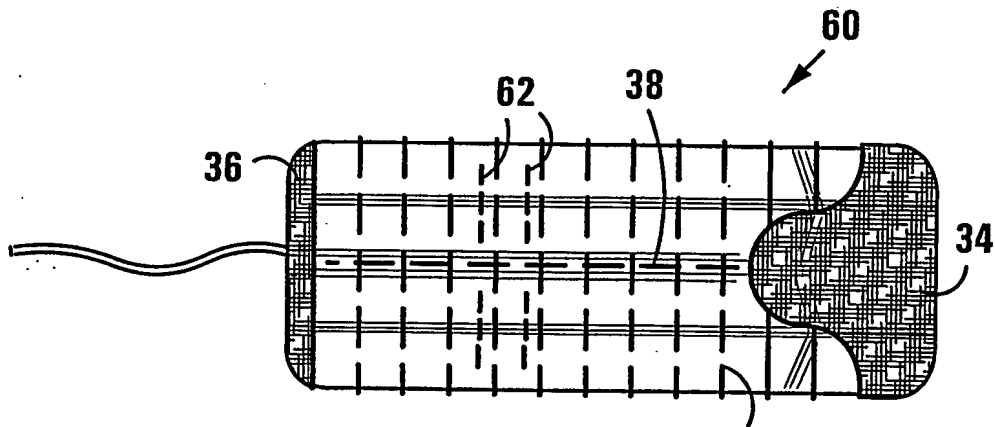


FIG 5

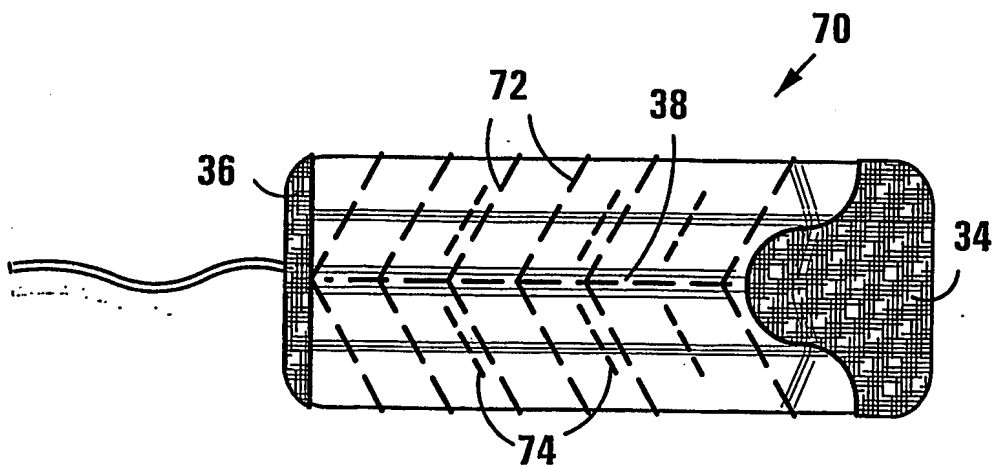


FIG 6